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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/756,386	01/14/2004	Jean-Luc Cabioch	033818-032	1882

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EXAMINER	
TESKIN, FRED M	
ART UNIT	PAPER NUMBER
1713	

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/756,386	CABIOCH ET AL.	
	Examiner	Art Unit	
	Fred M. Teskin	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13-24 and 26* is/are allowed.

6)☒ Claim(s) *1,4-7,25,27 and 30, 34-36* is/are rejected.

7)☒ Claim(s) *2,3,8-12,28,29 and 31-33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *011404*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claims 1-36 are currently pending and under examination herein.

Claims 8-12 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The recitation of a "branched" structure and molecular weight values outside the ranges recited in claims 1, 2, 3 and 7 (for the same parameter) renders claims 8-12 improper dependent claims – that is, they can conceivably be infringed by subject matter that would not infringe the base claim; e.g., branched diene elastomer having a number-average molecular weight of 301,000 or 350,000 g/mol would literally infringe claims 8-12, but not claim 1 nor any of claims 2-7. See MPEP 608.01 (n)(III).

Claims 25 and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 25 and 36, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 3966691 to Halasa.

The claimed subject matter is a linear diene elastomer resulting from at least one conjugated diene, characterized in that it comprises cyclic vinyl units in a mass content of greater than or equal to 15 % and in that it has a number-average molecular weight falling within a range of 10,000 to 300,000 g/mol.

Halasa discloses a cyclized polymer of linear conjugated diene, the polymer being characterized in that it has a cyclized polymer content of 10 to 60 % or more and a molecular weight of about 500 to 12,000 (see, col. 1, lines 24-28; col. 2, lines 57-65; and col. 3, lines 10-25). The cyclized polymer is further characterized by a high 1,2- (i.e., vinyl) structure and the cyclic structures are said to be aliphatic, per column 4, lines

50-57. That the cyclized polymer is an elastomer is indicated at column 8, lines 44-47 ("the cyclized polymer comprises at least 10 percent ... of the *elastomer* present ...").

Cyclized polymers meeting the claim limitations at to mass content of cyclic vinyl units, but possessing a number average molecular weight Mn below 10,000 g/mol, are exemplified, see Examples 2, 3 and 9.

However, as to molecular weight, Halasa repeatedly states that the polymer is produced with a molecular weight of about 500 to 12,000 (col. 1, ll. 23-24; col. 2, ll. 57-58; and col. 3, ll. 20-23) and teaches that with lithium catalyst, a narrower molecular weight distribution is achieved (col. 7, ll. 60-62). Further, the presence of lithium t-butoxide and TMEDA are said to *reduce* the concentration of the low molecular weight species relative to Example 1, performed in the absence of lithium alkoxide and chelating diamine (col. 8, ll. 1-12).

Applicants' claimed number average molecular weight range overlaps substantially the range disclosed by Halasa and therefore is rendered obvious by Halasa. One of ordinary skill would have been motivated to optimally adjust the relative proportions of lithium alkoxide and TMEDA in the patentee's process so as to obtain cyclized polymer having a Mn at the upper end of the disclosed range where the intended utility requires strength properties consistent with a higher molecular weight material. Thus, for example, where the cyclized polymer is to be used in moldings or mechanical goods as proposed as column 3, lines 39-40, one would have been led to modify the Halasa process so as to obtain cyclized polymer having a Mn as high as 12,000.

In cases involving overlapping ranges, such as the present case, it has consistently been held that even a slight overlap in range establishes a *prima facie* case of obviousness; see, e.g., *In re Woodruff*, 16 USPQ2d 1936 (claimed invention rendered obvious by prior art reference whose disclosed range ("about 1-5% carbon monoxide") abutted the claimed range ("more than 5% to about 25%" carbon monoxide) and *In re Geisler*, 43 USPQ2d at 1365 (acknowledging that claimed invention rendered *prima facie* obvious by prior art reference whose disclosed range (50-100 Angstroms) overlapped the claimed range (100-600 Angstroms)).

Claims 27, 30 and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6140434 to Halasa et al.

Halasa et al disclose an initiator system useful for preparing high vinyl butadiene rubber (col. 4, ll. 37-54). Most pertinently, the patentees' Example 1 details an initiator system comprising species of applicants' organolithium initiator, polar agent and alkali metal salt as claimed, but wherein the polar agent (TMEDA): initiator molar ratio is 8:1, rather than "greater than 8" as per claims 27 and 30. Nevertheless, these claims embrace molar ratio values so close to the exemplified ratio as to give rise to an expectation of similar activity, i.e., that the claimed catalytic system with an TMEDA: initiator molar ratio slightly higher than 8:1 would be similarly useful in synthesizing the high vinyl butadiene rubber of Halasa et al. The expectation of equivalent utility would have motivated one of ordinary skill to modify the patentees' initiator system by increasing the TMEDA : initiator molar ratio therein to a value within the claimed range.

Indeed, it has been held that a *prima facie* case of obviousness exists when the claimed range and the prior art range do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties, *Titanium Metals v. Banner*, 227 USPQ 773, 779 (Fed. Cir. 1985).

Concerning the statement of intended utility in the preamble of each of claims 27 and 30 (i.e., "usable for producing ... linear diene elastomer "), this recitation has not been given patentable weight because it merely states the purpose or intended use of a catalytic system, and the body of the each claim does not depend on the preamble for completeness but, instead, the recited compositional limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Claims 27, 30 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4316820 to Wieder et al.

Wieder et al disclose a catalyst comprising (a) an organometallic compound of formula RMe where R represents a saturated aliphatic or aromatic hydrocarbon radical of 2 to 8 carbon atoms and Me is an alkali metal; (b) a compound of formula R'OMe' where R' represents a saturated aliphatic or aromatic hydrocarbon radical of 2 to 8 carbon atoms and Me' is an alkali metal; and (c) a tertiary aliphatic triamine (col. 2, ll. 5-16). In particular, Wieder et al exemplify (Example 1) a catalyst that meets the compositional limitations of claims 27, 30 and 36 but for a polar agent : initiator molar ratio being less than 8, e.g., 1:1 as in Example 1(g). However, Wieder et al express

preference for a molar ratio of components (a) and (c) defined by a range of 0.1:1 to 10:1 (col. 2, ll. 49-52). The lower endpoint of 0.1:1 equates to a 1:10 ratio of (a) to (c) and thus would have suggested the suitability of a molar ratio of polar agent to organolithium initiator within the claimed range. Given this expressed preference, one of ordinary skill would have been led to modify the patentees' catalyst by adjusting the relative proportions of tertiary aliphatic triamine to organolithium compound therein to obtain a molar ratio of at least 8, e.g., 10:1, and thereby produce a catalytic system within claims 27, 30 and 36. Accordingly, the subject matter of these claims would have been *prima facie* obvious to one having ordinary skill in the art at the time of invention.

Claims 13-24 and 26 are allowable over the prior art of record. Claim 25 would be allowable if amended or rewritten to overcome the rejection under 35 U.S.C. 112 set forth in this Office action. Claims 2, 3, 8-12, 28, 29 and 31-33 are objected to as being dependent on a rejected base claim but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim.

The following is a statement of reasons for the indication of allowable subject matter: Independent process claims 13, 14 and 15 each require anionic polymerization of the stated monomers either by a discontinuous reaction with the molar ratio of polar agent to organolithium initiator being greater than 8, or by a continuous reaction with the molar ratio of polar agent to organolithium initiator being greater than or equal to 3. Halasa '691, considered to be representative of the closest prior art, teaches a batch-

type (i.e., discontinuous) polymerization wherein the molar ratio of TMEDA to Na metal is no greater than 4 (Example 14). There is no teaching or suggestion to employ a molar ratio of chelating tertiary diamine to organolithium initiator of greater than 8 in the discontinuous reaction, or to undertake the disclosed process as a continuous reaction with a chelating tertiary diamine to organolithium molar ratio greater than or equal to 3. In addition, Halasa '691 does not contemplate a branched structure as required by claims 8-12.

Any inquiry concerning this communication should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FRED TESKIN
PRIMARY EXAMINER
1713

FMTeskin/03-17-06